

What is claimed is:

1. An isolated or recombinant gene that is a regulator of fungal gene expression, the gene being selected from the group consisting of Pc804 (SEQ ID NO.1),  
5 An01 (SEQ ID NO. 3), An05 (SEQ ID NO. 5), An09 (SEQ ID NO 7), An10 (SEQ ID NO. 9), An13 (SEQ ID NO. 11), An17 (SEQ ID NO. 13), An20 (SEQ ID NO. 15), An28 (SEQ ID NO. 17), An34 (SEQ ID NO. 19), At01-1 (SEQ ID NO. 21), At01-2 (SEQ ID NO. 23), At03 (SEQ ID NO. 25), At05 (SEQ ID NO. 27), At07 (SEQ ID NO. 29), At08 (SEQ ID NO. 31), At11 (SEQ ID NO. 33), At14 (SEQ ID NO. 35), At16 (SEQ ID NO.  
10 37), At18 (SEQ ID NO. 39), At19 (SEQ ID NO. 41), At20 (SEQ ID NO. 43), At22 (SEQ ID NO. 45), At24 (SEQ ID NO. 47), At27 (SEQ ID NO. 49), At32 (SEQ ID NO. 51), Pc05 (SEQ ID NO. 53), Pc06 (SEQ ID NO. 55), Pc07 (SEQ ID NO. 57), Pc08 (SEQ ID NO. 59), Pc09 (SEQ ID NO. 61), Pc10 (SEQ ID NO. 63), Pc18 (SEQ ID NO. 65), Pc23 (SEQ ID NO. 67), Pc24 (SEQ ID NO. 69), Pc25 (SEQ ID NO. 71), Pc33 (SEQ ID NO.  
15 73), Pc34 (SEQ ID NO. 75), At501 (SEQ ID NO. 77), At574 (SEQ ID NO. 79), At279 (SEQ ID NO. 81), At286 (SEQ ID NO. 83), At291 (SEQ ID NO. 85), At320 (SEQ ID NO. 87), At322 (SEQ ID NO. 89), An1000 (SEQ ID NO. 91), At167 (SEQ ID NO. 93), At221 (SEQ ID NO. 95), At233 (SEQ ID NO. 97), At239 (SEQ ID NO. 99), At240 (SEQ ID NO. 101), At274 (SEQ ID NO. 103), Pc1000 (SEQ ID NO. 105), Pc1001 (SEQ ID  
20 NO.107)

2. The isolated or recombinant gene according to claim 1, wherein the gene is Pc804 (SEQ ID NO.1).

25 3. The isolated or recombinant gene according to claim 1, wherein the gene is An01 (SEQ ID NO. 3).

4. The isolated or recombinant gene according to claim 1, wherein the gene is An05 (SEQ ID NO. 5).

5. . The isolated or recombinant gene according to claim 1, wherein the gene is An09 (SEQ ID NO. 7).

6. . The isolated or recombinant gene according to claim 1, wherein the gene is An10 (SEQ ID NO. 9).

7. . The isolated or recombinant gene according to claim 1, wherein the gene is An13 (SEQ ID NO. 11).

8. . The isolated or recombinant gene according to claim 1, wherein the gene is An17 (SEQ ID NO. 13).

9. . The isolated or recombinant gene according to claim 1, wherein the gene is An20 (SEQ ID NO. 15)

10. . The isolated or recombinant gene according to claim 1, wherein the gene is An28 (SEQ ID NO. 17).

11. . The isolated or recombinant gene according to claim 1, wherein the gene is An34 (SEQ ID NO. 19).

12. . The isolated or recombinant gene according to claim 1, wherein the gene is At01-1 (SEQ ID NO. 21).

13. . The isolated or recombinant gene according to claim 1, wherein the gene is At01-2 (SEQ ID NO. 23).

14. . The isolated or recombinant gene according to claim 1, wherein the gene is At03 (SEQ ID NO. 25).

15. . The isolated or recombinant gene according to claim 1, wherein the gene is At05 (SEQ ID NO. 27).

16. . The isolated or recombinant gene according to claim 1, wherein the gene is At07 (SEQ ID NO. 29).

17. . The isolated or recombinant gene according to claim 1, wherein the gene is At08 (SEQ ID NO. 31).

18. . The isolated or recombinant gene according to claim 1, wherein the gene is At11 (SEQ ID NO. 33).

19. . The isolated or recombinant gene according to claim 1, wherein the gene is At14 (SEQ ID NO. 35).

20. . The isolated or recombinant gene according to claim 1, wherein the gene is At16 (SEQ ID NO. 37).

21. . The isolated or recombinant gene according to claim 1, wherein the gene is At18 (SEQ ID NO. 39).

22. . The isolated or recombinant gene according to claim 1, wherein the gene is At19 (SEQ ID NO. 41).

23. . The isolated or recombinant gene according to claim 1, wherein the gene is At20 (SEQ ID NO. 43).

24. . The isolated or recombinant gene according to claim 1, wherein the gene is At22 (SEQ ID NO. 45).

25. . The isolated or recombinant gene according to claim 1, wherein the gene is At24 (SEQ ID NO. 47).

26. . The isolated or recombinant gene according to claim 1, wherein the gene is At27 (SEQ ID NO. 49).

27. . The isolated or recombinant gene according to claim 1, wherein the gene is At32 (SEQ ID NO. 51).

28. . The isolated or recombinant gene according to claim 1, wherein the gene is Pc05 (SEQ ID NO. 53).

29. . The isolated or recombinant gene according to claim 1, wherein the gene is Pc06 (SEQ ID NO. 55).

30. . The isolated or recombinant gene according to claim 1, wherein the gene is Pc07 (SEQ ID NO. 57).

31. . The isolated or recombinant gene according to claim 1, wherein the gene is Pc08 (SEQ ID NO. 59).

32. . The isolated or recombinant gene according to claim 1, wherein the gene is Pc09 (SEQ ID NO. 61).

33. . The isolated or recombinant gene according to claim 1, wherein the gene is Pc10 (SEQ ID NO. 63).

34. . The isolated or recombinant gene according to claim 1, wherein the gene is Pc18 (SEQ ID NO. 65).

35. . The isolated or recombinant gene according to claim 1, wherein the gene is Pc23 (SEQ ID NO. 67).

36. . The isolated or recombinant gene according to claim 1, wherein the gene is Pc24 (SEQ ID NO. 69).

37. . The isolated or recombinant gene according to claim 1, wherein the gene is Pc25 (SEQ ID NO. 71).

38. . The isolated or recombinant gene according to claim 1, wherein the gene is Pc33 (SEQ ID NO. 73).

39. . The isolated or recombinant gene according to claim 1, wherein the gene is Pc34 (SEQ ID NO. 75).

40. . The isolated or recombinant gene according to claim 1, wherein the gene is At501 (SEQ ID NO. 77).

41. . The isolated or recombinant gene according to claim 1, wherein the gene is At574 (SEQ ID NO. 79).

42. . The isolated or recombinant gene according to claim 1, wherein the gene is At279 (SEQ ID NO. 81).

43. . The isolated or recombinant gene according to claim 1, wherein the gene is At286 (SEQ ID NO. 83).

44. . The isolated or recombinant gene according to claim 1, wherein the gene is At291 (SEQ ID NO. 85).

45. . The isolated or recombinant gene according to claim 1, wherein the gene is At320 (SEQ ID NO. 87).

5 46. . The isolated or recombinant gene according to claim 1, wherein the gene is At322 (SEQ ID NO. 89).

47. . The isolated or recombinant gene according to claim 1, wherein the gene is An1000 (SEQ ID NO. 91).

10 48. . The isolated or recombinant gene according to claim 1, wherein the gene is At167 (SEQ ID NO. 93).

49. . The isolated or recombinant gene according to claim 1, wherein the gene is At221 (SEQ ID NO. 95).

15 50. . The isolated or recombinant gene according to claim 1, wherein the gene is At233 (SEQ ID NO. 97).

20 51. . The isolated or recombinant gene according to claim 1, wherein the gene is At239 (SEQ ID NO. 99).

52. . The isolated or recombinant gene according to claim 1, wherein the gene is At240 (SEQ ID NO. 101).

25 53. . The isolated or recombinant gene according to claim 1, wherein the gene is At274 (SEQ ID NO. 103).

54. . The isolated or recombinant gene according to claim 1, wherein the gene is Pc1000 (SEQ ID NO. 105).

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55. . The isolated or recombinant gene according to claim 1, wherein the gene is Pc1001 (SEQ ID NO.107).

56. An isolated or recombinant nucleic acid that is specifically complementary  
5 to a gene according to claim 1.

57. A purified protein selected from the group consisting of Pc804 (SEQ ID NO. 2), An01 (SEQ ID NO. 4), An05 (SEQ ID NO. 6), An09 (SEQ ID NO 8), An10 (SEQ ID NO. 10), An13 (SEQ ID NO. 12), An17 (SEQ ID NO. 14), An20 (SEQ ID NO. 16), An28 (SEQ ID NO. 18), An34 (SEQ ID NO. 20), At01-1 (SEQ ID NO. 22), At01-2 (SEQ ID NO. 24), At03 (SEQ ID NO. 26), At05 (SEQ ID NO. 28), At07 (SEQ ID NO. 30), At08 (SEQ ID NO. 32), At11 (SEQ ID NO. 34), At14 (SEQ ID NO. 36), At16 (SEQ ID NO. 38), At18 (SEQ ID NO. 40), At19 (SEQ ID NO. 42), At20 (SEQ ID NO. 44), At22 (SEQ ID NO. 46), At24 (SEQ ID NO. 48), At27 (SEQ ID NO. 50), At32 (SEQ ID NO. 52), Pc05 (SEQ ID NO. 54), Pc06 (SEQ ID NO. 56), Pc07 (SEQ ID NO. 58), Pc08 (SEQ ID NO. 60), Pc09 (SEQ ID NO. 62), Pc10 (SEQ ID NO. 64), Pc18 (SEQ ID NO. 66), Pc23 (SEQ ID NO. 68), Pc24 (SEQ ID NO. 70), Pc25 (SEQ ID NO. 72), Pc33 (SEQ ID NO. 74), Pc34 (SEQ ID NO. 76), At501 (SEQ ID NO. 78), At574 (SEQ ID NO. 80), At279 (SEQ ID NO. 82), At286 (SEQ ID NO. 84), At291 (SEQ ID NO. 86), At320 (SEQ ID NO. 88), At322 (SEQ ID NO. 90), An1000 (SEQ ID NO. 92), At167 (SEQ ID NO. 94), At221 (SEQ ID NO. 96), At233 (SEQ ID NO. 98), At239 (SEQ ID NO. 100), At240 (SEQ ID NO. 102), At274 (SEQ ID NO. 104), Pc1000 (SEQ ID NO. 106), and Pc1001 (SEQ ID NO.108).

58. A binding agent that specifically binds to a protein according to claim 57.

59. An isolated or recombinant gene that regulates *FLO11* expression selected from the group consisting of An01 (SEQ ID NO. 3), An05 (SEQ ID NO. 5), An09 (SEQ ID NO 7), An10 (SEQ ID NO. 9), An13 (SEQ ID NO. 11), An17 (SEQ ID NO. 13), An20 (SEQ ID NO. 15), An28 (SEQ ID NO. 17), An34 (SEQ ID NO. 19), At01-1 (SEQ ID NO. 21), At01-2 (SEQ ID NO. 23), At03 (SEQ ID NO. 25), At05 (SEQ ID NO. 27),

At07 (SEQ ID NO. 29), At08 (SEQ ID NO. 31), At11 (SEQ ID NO. 33), At14 (SEQ ID NO. 35), At16 (SEQ ID NO. 37), At18 (SEQ ID NO. 39), At19 (SEQ ID NO. 41), At20 (SEQ ID NO. 43), At22 (SEQ ID NO. 45), At24 (SEQ ID NO. 47), At27 (SEQ ID NO. 49), At32 (SEQ ID NO. 51), Pc05 (SEQ ID NO. 53), Pc06 (SEQ ID NO. 55), Pc07 (SEQ ID NO. 57), Pc08 (SEQ ID NO. 59), Pc09 (SEQ ID NO. 61), Pc10 (SEQ ID NO. 63), Pc18 (SEQ ID NO. 65), Pc23 (SEQ ID NO. 67), Pc24 (SEQ ID NO. 69), Pc25 (SEQ ID NO. 71), Pc33 (SEQ ID NO. 73), and Pc34 (SEQ ID NO. 75).

60. An isolated or recombinant gene that regulates *lovF* expression selected from the group consisting of At279 (SEQ ID NO. 81), At286 (SEQ ID NO. 83), At291 (SEQ ID NO. 85), At320 (SEQ ID NO. 87), At322 (SEQ ID NO. 89), An1000 (SEQ ID NO. 91), At167 (SEQ ID NO. 93), At221 (SEQ ID NO. 95), At233 (SEQ ID NO. 97), At239 (SEQ ID NO. 99), At240 (SEQ ID NO. 101), At274 (SEQ ID NO. 103), Pc1000 (SEQ ID NO. 105), and Pc1001 (SEQ ID NO.107).

61. An isolated or recombinant gene that regulates *lovE* expression selected from the group consisting of At501 (SEQ ID NO. 77) and At574 (SEQ ID NO. 79).

62. An isolated or recombinant gene that regulates *acvA* expression selected from the group consisting of Pc804 (SEQ ID NO.1)

63. A purified protein that regulates *FLO11* expression selected from the group consisting of An01 (SEQ ID NO. 4), An05 (SEQ ID NO. 6), An07 (SEQ ID NO. 8), An09 (SEQ ID NO 8), An10 (SEQ ID NO. 10), An13 (SEQ ID NO. 12), An17 (SEQ ID NO. 14), An20 (SEQ ID NO. 16), An28 (SEQ ID NO. 18), An34 (SEQ ID NO. 20), At01-1 (SEQ ID NO. 22), At01-2 (SEQ ID NO. 24), At03 (SEQ ID NO. 26), At05 (SEQ ID NO. 28), At07 (SEQ ID NO. 30), At08 (SEQ ID NO. 32), At11 (SEQ ID NO. 34), At14 (SEQ ID NO. 36), At16 (SEQ ID NO. 38), At18 (SEQ ID NO. 40), At19 (SEQ ID NO. 42), At20 (SEQ ID NO. 44), At22 (SEQ ID NO. 46), At24 (SEQ ID NO. 48), At27 (SEQ ID NO. 50), At32 (SEQ ID NO. 52), Pc05 (SEQ ID NO. 54), Pc06 (SEQ ID NO. 56), Pc07 (SEQ ID NO. 58), Pc08 (SEQ ID NO. 60), Pc09 (SEQ ID NO. 62), Pc10 (SEQ



ID NO. 64), Pc18 (SEQ ID NO. 66), Pc23 (SEQ ID NO. 68), Pc24 (SEQ ID NO. 70), Pc25 (SEQ ID NO. 72), Pc33 (SEQ ID NO. 74), and Pc34 (SEQ ID NO. 76).

63. A purified protein that regulates *lovF* expression selected from the group consisting of At279 (SEQ ID NO. 82), At286 (SEQ ID NO. 84), At291 (SEQ ID NO. 86), At320 (SEQ ID NO. 88), At322 (SEQ ID NO. 90), An1000 (SEQ ID NO. 92), At167 (SEQ ID NO. 94), At221 (SEQ ID NO. 96), At233 (SEQ ID NO. 98), At239 (SEQ ID NO. 100), At240 (SEQ ID NO. 102), At274 (SEQ ID NO. 104), Pc1000 (SEQ ID NO. 106), and Pc1001 (SEQ ID NO.108).

64. A purified protein that regulates *lovE* expression selected from the group consisting of At501 (SEQ ID NO. 78) and At574 (SEQ ID NO. 80).

65. A purified protein that regulates *acvA* expression selected from the group consisting of Pc804 (SEQ ID NO.2)

66. A method for modulating production of a secondary metabolite or enzyme, the method comprising expressing in the fungus a gene according to claim 1.

67. A chimeric fungal regulator gene or gene product selected from the group consisting of SEQ ID NOS. 112-132.

68. A method for modulating production of a secondary metabolite or enzyme, the method comprising expressing in the fungus a chimeric fungal regulator gene according to claim 67.